

sita; flores non visi. Capsula ovoidea vel ellipsoidea 1.4 cm. longa et 5 mm. lata, pedicello circiter 1 cm. longo pubescente erecto, 10-costata costis anguste alatis, calycis lobis coronata.

BONIN ISLANDS: Mukō-jima, sea-level to 200 m. alt., April 28, 1917, *E. H. Wilson* (No. 8343, type); Chichi-jima, cliffs, sea-level to 200 m. alt., common, April 23 1917, *E. H. Wilson* (No. 8277).

This very interesting addition to the flora of eastern Asia is fairly common in open grassy places on all the islands which Wilson visited, and it seems strange that it should have remained without a name. It had been apparently first found by C. Wright according to a statement by Hillebrand in his *Flora of the Hawaiian Islands*, p. 237 (1888), who mentions under *Lobelia Gaudichaudii* De Candolle a specimen collected by Wright on the Loo-choo Islands (apparently a mistake for Bonin Islands, for there is no such *Lobelia* known from the Liukiu Islands) and says that it resembles the present species (*L. Gaudichaudii*) greatly and that it is preserved in the Harvard Herbarium, but there is now no *Lobelia* from the Bonin Islands in the Gray Herbarium and none is mentioned in Dr. Gray's manuscript list of Bonin and Loo-choo plants. Our new species is undoubtedly near *L. Gaudichaudii*, but that species has sessile leaves with a broad base and a conspicuous row of resinous glands on the margins.

At the last moment, when this article was already in press, we discovered that Koidzumi had described and figured this *Lobelia* which we had supposed to be an undescribed species in Matsumura's *Icones Plantarum Koisikavenses*.

NEW SPECIES, VARIETIES AND COMBINATIONS FROM THE HERBARIUM AND THE COLLECTIONS OF THE ARNOLD ARBORETUM¹

ALFRED REHDER

FAGACEAE

Castanopsis Spach

IN the limitation of this genus I am following Schottky and unite the section *Chlamydobalanus* Endlicher (sub *Quercu*; Oersted sub *Pasania*) with *Castanopsis*. From *Castanea* the genus is easily distinguished by the evergreen often entire leaves. From *Lithocarpus* it differs in the thin cupula usually enclosing the nut entirely and splitting at maturity to liberate it; the cupula is furnished with spines or tubercles arranged in usually oblique zones, it is never covered by closely imbricate scales nor by concentric distinct rings; the number of flowers varies from 3-1 in a cupula. The leaves are usually distichously arranged.

Castanopsis acuminatissima, comb. nov. — *Quercus lineata* Miquel, Pl. Junghuhn. i. 10 (1850), non Blume. — *Castanea acuminatissima* Blume, Mus. Bot. Lugd.-Bat. i. 283 (1850). — *Quercus fagiformis* Junghuhn in

¹ Continued from p. 60.

Bonplandia vi. 82, fig. (1858).¹ — *Quercus Junghuhnii* Miquel, F. Ind. Bat. I. pt. I. 853 (1858). — Oudemans in Verh. Akad. Wet. Amsterd. XI. No. 3, 15, t. 9 (Annot. Crit. Cupulif. Jav.) (1865). — King in Ann. Bot. Gard. Calcutta, II. 78, t. 73 (1889). — *Quercus acuminatissima* A. De Candolle, Prodr. XVI. pt. II. 102 (1864). — *Pasania acuminatissima* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 84 (1866).

JAVA.

Castanopsis Blumeana, comb. nov. — *Quercus Blumeana* Korthals in Verh. Nat. Geschied. Bot. 208, t. 44 (1842). — King in Ann. Bot. Calcutta, II. 75, t. 69B (1889). — *Cyclobalanus Blumeana* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 81 (1866). — *Synaedrys Blumeana* Koidzumi in Tokyo Bot. Mag. XXX. 186 (1916).

SUMATRA, BORNEO.

Castanopsis encleisocarpa, comb. nov. — *Quercus encleisocarpa* Korthals in Verh. Nat. Geschied. Bot. 208, t. 45 (1842). — King in Ann. Bot. Gard. Calcutta, II. 80, t. 75, figs. 1-3 (1889). — *Cyclobalanus encleistocarpa* [sic] Oersted in Naturh. For. Vidensk. Meddel. XVIII. 81 (1866). — *Synaedrys encleisocarpa* Koidzumi in Tokyo Bot. Mag. XXX. 186 (1916).

SUMATRA.

Castanopsis reflexa, comb. nov. — *Quercus reflexa* King in Ann. Bot. Gard. Calcutta, II. 78, t. 72 (1889). — *Synaedrys reflexa* Koidzumi in Tokyo Bot. Mag. XXX. 187 (1916).

BORNEO.

Lithocarpus Bl.

Blume's name *Lithocarpus* of 1825 must replace *Synaedrys* Lindley of 1836 taken up by Koidzumi and *Pasania* Oersted of 1866 which has been so far the generally accepted name for the genus. For citations of literature and further remarks see foot-note in Sargent, Pl. Wilson. III. 205 (1916).

Lithocarpus acuminata, comb. nov. — *Quercus acuminata* Roxburgh, Fl. Ind. ed. 2, III. 636 (1832). — Wight, Icon. I. t. 221, figs. 6-9 (1840). — King in Ann. Bot. Gard. Calcutta, II. 41, t. 32B (1889). — *Quercus fenestrata* var. *acuminata* Wenzig in Jahrb. Bot. Gard. Berlin, IV. 224 (1886). — *Pasania acuminata* Oersted in Naturh. For. Vidensk. Meddel. XVI. 83 (1866). — *Synaedrys acuminata* Koidzumi in Tokyo Bot. Mag. XXX. 193 (1916).

MALESIA.

Lithocarpus amygdalifolia, comb. nov. — *Quercus amygdalifolia* Skan in Jour. Linn. Soc. XXVI. 506 (1899). — *Pasania amygdalifolia* Schottky in Bot. Jahrb. XLVII. 660 (1912). — *Synaedrys amygdalina* (sic) Koidzumi in Tokyo Bot. Mag. 188 (1916).

CHINA.

¹ Junghuhn's article is stated to be a translation from the *Natuurk. Tijdschr. Ned.-Ind.* ser. 3, IV. of 1857. but the Dutch original article was not published until the following year (in ser. 4, I. 23-138) and contains no reference to *Q. fagiformis*, the paragraph of the German translation from "Hier besteht der Wald" to "*Q. fagiformis*," including the figure and foot-note, being entirely omitted from the Dutch article.

Lithocarpus apoensis, comb. nov. — *Quercus apoensis* Elmer in Leaflet. Philip. Bot. III. 945 (1910).

PHILIPPINE ISLANDS.

Lithocarpus attenuata, comb. nov. — *Quercus Eyrei* Hance in Jour. Bot. XXII. 229 (1884), non Champion. — *Quercus attenuata* Skan in Jour. Linn. Soc. XXVI. 506 (1899). — *Pasania attenuata* Schottky in Bot. Jahrb. XLVII. 675 (1912).

CHINA: Hongkong.

Lithocarpus Bennetti, comb. nov. — *Quercus Bennetti* Miquel, Fl. Ind. Bat. I. pt. I. 857 (1856). — King in Ann. Bot. Gard. Calcutta, II. 64, t. 58a (1889). — Merrill in Philip. Jour. Sci. III. Bot. 328 (1908). — *Quercus Llanosii* Fernandez-Villar, Nov. App. Fl. Filip. 208 (1883), non A. De Candolle. — *Quercus Wenzigiana* Merrill in Philip. Jour. Sci. I. suppl. 41 (1906), non King. — *Synaedrys Bennetti* Koidzumi in Tokyo Bot. Mag. XXX. 190 (1916).

PHILIPPINE ISLANDS.

Lithocarpus brevicaudata, comb. nov. — *Quercus brevicaudata* Skan in Jour. Linn. Soc. XXVI. 508 (1899). — *Pasania brevicaudata* Schottky in Bot. Jahrb. XLVII. 666 (1912). — *Synaedrys brevicaudata* Koidzumi in Tokyo Bot. Mag. XXX. 194 (1916).

FORMOSA.

Lithocarpus Carolinae, comb. nov. — *Quercus Carolinae* Skan in Jour. Linn. Soc. XXXV. 518 (1903). — *Pasania Carolinae* Schottky in Bot. Jahrb. XLVII. 673 (1912). — *Synaedrys Carolinae* Koidzumi in Tokyo Bot. Mag. XXX. 194 (1916).

CHINA: Yunnan.

Lithocarpus cathayana, comb. nov. — *Quercus cathayana* Seemen in Fedde, Rep. Spec. Nov. III. 53 (1906). — *Pasania cathayana* Schottky in Bot. Jahrb. XLVII. 663 (1912). — *Synaedrys cathayana* Koidzumi in Tokyo Bot. Mag. XXX. 188 (1916).

CHINA.

Lithocarpus caudatifolia, comb. nov. — *Quercus caudatifolia* Merrill in Philip. Jour. Sci. III. Bot. 324 (1908). — *Synaedrys caudatifolia* Koidzumi in Tokyo Bot. Mag. XXX. 190 (1916).

PHILIPPINE ISLANDS.

Lithocarpus celebica, comb. nov. — *Quercus celebica* Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 110 (1863). — *Cyclobalanus celebica* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 81 (1866). — *Synaedrys celebica* Koidzumi in Tokyo Bot. Mag. XXX. 194 (1916).

CELEBES.

Lithocarpus clathrata, comb. nov. — *Quercus clathrata* Seemen in Bot. Jahrb. XXVII. beibl. LXIV. 15 (1900). — *Synaedrys clathrata* Koidzumi in Tokyo Bot. Mag. XXX. 190 (1916).

JAVA.

Lithocarpus conocarpa, comb. nov. — *Quercus conocarpa* Oudemans in Versl. Akad. Wetensch. Amsterd. Afdeel. Natuurk. XII. 206 (1861); in

Verh. Akad. Wet. Amsterd. xi. No. 3, 18, t. 10 (Annot. Cupulif. Jav.) (1865). — King in Ann. Bot. Gard. Calcutta, ii. 61, t. 56a (1889). — *Cyclobalanus conocarpa* Oersted in Naturh. For. Vidensk. Meddel. xviii. 81 (1866). — *Synaedrys conocarpa* Koidzumi in Tokyo Bot. Mag. xxx. 191 (1916).

JAVA.

Lithocarpus cooperta, comb. nov. — *Castanea cooperta* Oersted in Vidensk. Selsk. Naturvid. Skrift. ser. 5, ix. 379 (1873). — *Quercus cooperta* Blanco, Fl. Filip. ed. 2, 503 (1845). — *Castanopsis costata* Fernandez-Villar, Nov. App. Fl. Filip. 209 (1883), non A. De Candolle. — *Quercus Fernandezii* Vidal, Sinops. Atl. xli. t. 92, fig. E (1883). — *Synaedrys cooperta* Koidzumi in Tokyo Bot. Mag. xxx. 186 (1916).

PHILIPPINE ISLANDS.

Lithocarpus Copelandii, comb. nov. — *Quercus Copelandii* Elmer in Leaflet. Philip. Bot. VI. 1984 (1913).

PHILIPPINE ISLANDS.

Lithocarpus costata, comb. nov. — *Quercus costata* Blume, Fl. Jav. Cupulif. 25, t. 13 (1828-50). — King in Ann. Bot. Gard. Calcutta, ii. 82, t. 76a (1889). — *Lithocarpus scutigera* Oudemans in Meded. Akad. Amsterd. Afd. Natuurk. xii. 207 (1861); in Verh. Akad. Wet. Amsterd. xi., No. 3, 20, t. 12 (Annot. Cupulif. Jav.) (1865). — *Cyclobalanus costata* Oersted in Naturh. For. Vidensk. Meddel. xviii. 81, t. 1-2, fig. 14 (1866). — Koorders & Valetton, Bijdr. Jaav. Booms. x. 60 (1904). — *Synaedrys costata* Koidzumi in Tokyo Bot. Mag. xxx. 188 (1916).

MALESIA.

Lithocarpus Curranii, comb. nov. — *Quercus curranii* Merrill in Philip. Jour. Sci. III. Bot. 329 (1908). — *Synaedrys Curranii* Koidzumi in Tokyo Bot. Mag. xxx. 189 (1916).

PHILIPPINE ISLANDS.

Lithocarpus crassinervia, comb. nov. — *Quercus crassinervia* Blume, Mus. Bot. Lugd.-Bat. i. 292 (1850). — *Quercus pseudo-molucca* Bl. β . *crassinervia* Miquel, Fl. Ind. Bat. i. pt. i. 849 (1855). — *Pasania crassinervia* Oersted in Naturh. For. Vidensk. Meddel. xviii. 84 (1866). — *Synaedrys crassinervia* Koidzumi in Tokyo Bot. Mag. xxx. 194 (1916).

JAVA.

Lithocarpus cyrtorhyncha, comb. nov. — *Quercus cyrtorhyncha* Miquel, Fl. Ned. Ind. Suppl. 350 (1840). — King in Ann. Bot. Gard. Calcutta, ii. 66B (1889). — *Synaedrys cyrtorhyncha* Koidzumi in Tokyo Bot. Mag. xxx. 191 (1916).

SUMATRA.

Lithocarpus dasystachya, comb. nov. — *Quercus dasystachya* Miquel in Ann. Mus. Bot. Lugd.-Bat. i. 221 (1864-65). — *Synaedrys dasystachya* Koidzumi in Tokyo Bot. Mag. xxx. 194 (1916).

BORNEO.

Lithocarpus dealbata, comb. nov. — *Quercus dealbata* Hooker f. & Thomson apud A. De Candolle, Prodr. xvi. pt. ii. 85 (1864). — King in

Ann. Bot. Gard. Calcutta, II. 46, t. 40, figs. 1-4 (1889). — *Pasania dealbata* Oersted in Naturh. For. Vidensk. Meddel. xviii. 84 (1866). — *Quercus fenestrata* Roxb. var. *a. dealbata* Wenzig in Jahrb. Bot. Gard. Berlin, iv. 224 (1886). — *Synaedrys dealbata* Koidzumi in Tokyo Bot. Mag. xxx. 194 (1916).

INDIA: Nepal.

Lithocarpus densiflora Rehd. f. *lanceolata*, comb. nov. — *Pasania densiflora* f. *lanceolata* Jepson, Fl. Calif. 362 (1909); Silv. Calif. 237 (1910).

CALIFORNIA: Mendocino and Del Norte Counties.

Lithocarpus densiflora var. *montana*, comb. nov. — *Quercus echinoides* R. Brown Campst. in Ann. Mag. Nat. Hist. ser. 4, vii. 251 (1871). — *Quercus densiflora* Greene, West Am. Oaks, t. 24 (1889), non Hooker & Arnott. — *Quercus densiflora* var. *montana* Mayr, Wald. Nordam, 264, t. 2, fig. (1890). — *Quercus densiflora* var. *echinoides* Sargent, Silv. N. Am. viii. 183, t. 488, fig. 9 (1895). — *Pasania montana* Mayr, Wald- & Parkb. 487, t. 14, fig. (1906). — *Pasania densiflora* var. *echinoides* Jepson, Fl. Calif. 363 (1909); Silv. Calif. 237 (1910).

OREGON, CALIFORNIA.

Lithocarpus dolichocarpa, comb. nov. — *Quercus dolichocarpa* Seemen in Bot. Jahrb. xxvii. beibl. lxiv. 14 (1900). — *Synaedrys dolichocarpa* Koidzumi in Tokyo Bot. Mag. xxx. 191 (1916).

SUMATRA.

Lithocarpus edulis, comb. nov. — *Quercus glabra* Siebold & Zuccarini, Fl. Jap. i. 170, t. 89 (1841), non Thunberg. — Shirasawa, Icon. Ess. For. Jap. i. t. 32, figs. 14-24 (1900). — *Quercus edulis* Makino in Tokyo Bot. Mag. xi. (38) (1897). — *Pasania edulis* Makino, l. c. (39) (1897). — *Synaedrys edulis* Koidzumi in Tokyo Bot. Mag. xxx. (28), 191 (1916). — *Pasania glabra* Oersted in Naturh. Forh. Vidensk. Meddel. xviii. 83 (1866), pro parte, quoad cit. Sieb. & Zucc. — Schottky in Bot. Jahrb. xlvii. 669 (1912). — *Lithocarpus glabra* Rehder in Bailey, Stand. Cycl. Hort. vi. 3569 (1917), pro parte, quoad descriptionem.

JAPAN.

This species had been erroneously identified by Siebold & Zuccarini with *Q. glabra* Thunberg and this identification has been accepted by all subsequent botanists until Makino in 1897 showed that Thunberg's name properly belongs to the species described as *Q. thalassica* by Hance. See note under *Lithocarpus glabra*.

Lithocarpus Elizabethae, comb. nov. — *Quercus Elizabethae* Tutcher in Jour. Bot. xlix. 273 (1911). — *Pasania Elizabethae* Schottky in Bot. Jahrb. xlvii. 685 (1912).

CHINA: Hongkong.

Tutcher places this species under the section *Claymndobalanus*, but according to the specimens before me it belongs into the affinity of *L. dealbata* and *L. fenestrata*.

Lithocarpus Eyrei, comb. nov. — *Quercus Eyrei* Champion apud Benth in Hooker Jour. Bot. vi. 114 (1854).

CHINA: Hongkong.

Lithocarpus fenestrata, comb. nov. — *Quercus fenestrata*, Roxburgh, Fl. Ind. ed. 2, III. 633 (1832). — Wight, Icon. t. 219 (1840). — King in Ann. Bot. Gard. Calcutta, II. 45, t. 39 (1889). — *Quercus callicarpifolia* Griffith, Itin. Not. II. 87, No. 1268 (1848), pro parte. — *Pasania fenestrata* Oersted, in Naturh. For. Vidensk. Meddel. XVIII. 84 (1866). — *Synaedrys fenestrata* Koidzumi in Tokyo Bot. Mag. XXX. 195 (1916).

HIMALAYAS.

Lithocarpus formosana, comb. nov. — *Quercus formosana* Skan in Jour. Linn. Soc. XXVI. 513 (1899). — *Pasania formosana* Schottky in Bot. Jahrb. XLVII. 670 (1912). — *Synaedrys formosana* Koidzumi in Tokyo Bot. Mag. XXX. 195 (1916).

FORMOSA.

Lithocarpus glabra Rehder in Bailey, Stand. Cycl. Hort. VI. 3569 (1917), ex parte, quoad synonym. Thunberg. — *Quercus glabra* Thunberg, Fl. Jap. 175 (1784); Icon. Pl. Jap. IV. t. 5 (1802). — Willdenow, Spec. Pl. IV. 427 (1805). — Makino in Tokyo Bot. Mag. XI. (37) (1897). — *Quercus thalassica* Hance in Hooker Kew Jour. I. 176 (1849). — Shirasawa, Icon. Ess. For. Jap. I. t. 33 (1900). — *Quercus inversa* Lindley & Paxton, Flow. Gard. I. 58, fig. 36 (1850). — Seemann, Bot. Voy. Herald, 414, t. 88 (1852-57). — *Quercus Sieboldiana* Blume, Mus. Bot. Lugd.-Bat. I. 290 (1850). — *Quercus reversa* Benth in Hooker Kew Jour. VI. 112 (1854). — *Pasania glabra*, Oersted in Naturh. For. Vidensk. Meddel. XVIII. 83 (1866), ex parte, excl. syn. Sieb. & Zucc. — *Pasania thalassica* Oersted, l. c. (1866). — *Synaedrys glabra* Koidzumi in Tokyo Bot. Mag. XXX. (28), 195 (1916). — *Lithocarpus thalassica* Rehder in Bailey, Stand. Cycl. Hort. VI. 3569 (1917).

JAPAN.

Siebold & Zuccarini's identification of Thunberg's *Quercus glabra* with another Japanese species enumerated above as *Q. edulis*, had unfortunately been accepted by all later botanists, until Makino in 1897 pointed out that *Q. glabra* Thunberg is identical with *Q. thalassica* Hance and that *Q. glabra* Sieb. & Zucc. is a species hitherto unnamed for which he proposed the name *Q. edulis* or *Pasania edulis*. A careful comparison of herbarium material with Thunberg's description and with the figure in his Icones and also with an excellent photograph of the type specimen kindly sent to me by Professor O. Juel of Upsala has convinced me that Makino is right. Thunberg's description of the leaves as "utrinque glabra" has apparently misled botanists, as the leaves are distinctly pubescent only when young, while at maturity the underside is covered with a close scurfy tomentum which to the naked eye does not appear as tomentum, but the words "oblongo-lanceolata, cuspidata" fit only *Q. thalassica* Hance, and so does the description of the inflorescence as "spicae florum terminales . . . tomentosae," for in *L. edulis* the staminate spikes are axillary and glabrous. Moreover Thunberg's figure which is a fairly faithful representation of his type specimen agrees exactly with specimens of *Q. thalassica* before me and has little resemblance to *L. edulis*.

Lithocarpus Hancei, comb. nov. — *Quercus Hancei* Bentham, Fl. Hongkong. 322 (1861). — *Pasania Hancei* Schottky in Bot. Jahrb. XLVII. 669 (1912). — *Synaedrys Hancei* Koidzumi in Tokyo Bot. Mag. xxx. 191 (1916).

CHINA: Hongkong.

Lithocarpus Harlandii, comb. nov. — *Quercus Harlandii* Hance in Walper's Ann. III. 382 (1852). — *Pasania Harlandii* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 83 (1866). — *Synaedrys Harlandii* Koidzumi in Tokyo Bot. Mag. xxx. 191 (1916).

CHINA: Hongkong.

Lithocarpus heliciformis, comb. nov. — *Quercus heliciformis* Seemen in Bot. Jahrb. XXVII. beibl. LXIV. 15 (1900). — *Synaedrys heliciformis* Koidzumi in Tokyo Bot. Mag. xxx. 191 (1916).

JAVA.

Lithocarpus hystrix, comb. nov. — *Quercus hystrix* Korthals in Verh. Nat. Geschied. Bot. 201, t. 43 (1842). — King in Ann. Bot. Gard. Calcutta, II. 54, t. 50 (1889). — *Quercus Korthalsii* Bl. var. *hystrix* Blume, Mus. Bot. Lugd.-Bat. I. 293 (1850). — *Cyclobalanus hystrix* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 81 (1866). — *Synaedrys hystrix* Koidzumi in Tokyo Bot. Mag. xxx. 195 (1916).

MALESIA.

Lithocarpus induta, comb. nov. — *Quercus induta* Blume in Verh. Bat. Genoot. Wetensch. IX. 220 (1823); Fl. Jav. Cupulif. 23, t. 12 (1828-51). — King in Ann. Bot. Gard. Calcutta, II. 55, t. 51 (1889). — *Cyclobalanus induta* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 80, t. 1-2, fig. 17 (1866). — *Synaedrys induta* Koidzumi in Tokyo Bot. Mag. xxx. 195 (1916).

JAVA.

Lithocarpus Irwinii, comb. nov. — *Quercus Irwinii* Hance in Ann. Sci. Nat. ser. 4, XVIII. 229 (1862). — *Pasania Irwinii* Oersted in Naturh. For. Vidensk. For. Meddel. XVIII. 83 (1866). — *Synaedrys Irwinii* Koidzumi in Tokyo Bot. Mag. xxx. 195 (1916).

CHINA: Kwangtung, Hongkong.

Lithocarpus iteaphylla, comb. nov. — *Quercus iteaphylla* Hance in Jour. Bot. XXII. 229 (1884). — *Pasania iteaphylla* Schottky in Bot. Jahrb. XLVII. 669 (1912). — *Synaedrys iteaphylla* Koidzumi in Tokyo Bot. Mag. xxx. 196 (1916).

CHINA: Hongkong.

Lithocarpus Jordanae, comb. nov. — *Quercus Jordanae* Laguna, Apunt. Nuev. Roble Filip. 7, t. (1875). — *Quercus Vidalii* Fernandez-Villar, Nov. App. Fl. Filip. 209 (1883). — Vidal, Sin. Pl. Leñ. Filip. Atl. t. XLI. t. 92, fig. B (1883). — *Quercus caraballoana* Fernandez-Villar. l. c. 209 (1883). — *Quercus Havilandii* Seemen in Perkins, Fragm. Fl. Philip. 42 (1904), non Stapf. — *Quercus sundaica* Merrill in Philip. Jour. Sci. I. suppl. 41 (1906), non Blume. — *Synaedrys Jordanae* Koidzumi in Tokyo Bot. Mag. xxx. 196 (1916).

PHILIPPINE ISLANDS.

Lithocarpus lamponga, comb. nov. — *Quercus lamponga* Miquel, Fl. Ind. Bat. Suppl. 347 (1860). — King in Ann. Bot. Gard. Calcutta, II. 53, t. 49 (1889). — *Cyclobalanus lamponga* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 81 (1866). — *Quercus brevi-petiolata* Scheffer, Obs. Phyt. II. 47 (1869). — *Synaedrys lamponga* Koidzumi in Tokyo Bot. Mag. XXX. 196 (1916).

MALESIA.

Lithocarpus lappacea, comb. nov. — *Quercus lappacea* Roxburgh, Fl. Ind. ed. 2, III. 637 (1832). — Wight, Icon. I. t. 220 (1840). — King in Ann. Bot. Gard. Calcutta, II. 41, t. 33 (1889). — *Quercus hirsuta* Lindley in Wallich, Cat. no. 3734 (1829), nomen. — *Quercus Mackiana* Hooker, Icon. III. t. 224 (1840). — *Pasania lappacea* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 84 (1866). — *Synaedrys lappacea* Koidzumi in Tokyo Bot. Mag. XXX. 196 (1916).

HIMALAYAS.

Lithocarpus lipacon, comb. nov. — *Quercus lipacon* Elmer in Leaflet. Philip. Bot. VI. 1983 (1913).

PHILIPPINE ISLANDS.

Lithocarpus Llanosii, comb. nov. — *Quercus Llanosii* A. De Candolle, Prodr. XVI. pt. II. 97 (1864), excl. syn. Blancoi. — *Cyclobalanus Llanosii* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 80 (1866). — *Quercus campanoana* Vidal, Sin. Pl. Leñ. Filip. Atl. XLI. t. 92, f. D (1883). — *Quercus sundaica* Fernandez-Villar, Nov. App. Fl. Filip. 207 (1883), non Blume. — *Synaedrys Llanosii* Koidzumi in Tokyo Bot. Mag. XXX. 196 (1916).

PHILIPPINE ISLANDS.

Lithocarpus lucida, comb. nov. — *Quercus cuneata* Herb. Roxburgh apud Wallich, Cat. no. 3732 (1829), nomen, non Wangenheim. — A. De Candolle, Prodr. XVI. pt. II. 108 (1864), nomen. — *Quercus lucida* Roxburgh, Fl. Ind. ed. 2, III. 635 (1832). — King in Ann. Bot. Gard. Calcutta, II. 69, t. 64 (1889). — *Synaedrys lucida* Koidzumi in Tokyo Bot. Mag. XXX. 192 (1916).

MALAY PENINSULA.

Lithocarpus Maingayi, comb. nov. — *Quercus Maingayi* Benth in Hooker, Icon. XIV. t. 1314 (1880). — King in Ann. Bot. Gard. Calcutta, II. 82, t. 77 (1889). — *Synaedrys Maingayi* Koidzumi in Tokyo Bot. Mag. XXX. 189 (1916).

MALAY PENINSULA.

Lithocarpus Mairei, comb. nov. — *Pasania Mairei* Schottky in Bot. Jahrb. XLVII. 665 (1912). — *Synaedrys Maierei* [sic] Koidzumi in Tokyo Bot. Mag. XXX. 197 (1916).

CHINA: Yunnan.

Lithocarpus Merrittii, comb. nov. — *Quercus merrittii* Merrill in Philip. Jour. Sci. III. Bot. 325 (1908). — *Synaedrys Merrittii* Koidzumi in Tokyo Bot. Mag. XXX. 192 (1916).

PHILIPPINE ISLANDS.

Lithocarpus mindanaensis, comb. nov. — *Quercus philippinensis* Merrill

in Philip. For. Bur. Bull. i. 16 (1903), non A. De Candolle. — *Quercus celebica* Seemen in Perkins, Fragm. Philip. Fl. 41 (1904), non Miquel. — *Quercus acuminatissima* Merrill in Philip. Jour. Sci. III. Bot. 326 (1908), non A. De Candolle. — *Quercus mindanaensis* Elmer in Leaf. Philip. Bot. III. 942 (1910). — *Synaedrys acuminatissima* Koidzumi in Tokyo Bot. Mag. XXX. 190 (1916).

PHILIPPINE ISLANDS: Mindanao.

Lithocarpus monticola, comb. nov. — *Quercus monticola* King in Ann. Bot. Gard. Calcutta, II. 44, t. 37 (1889). — *Synaedrys monticola* Koidzumi in Tokyo Bot. Mag. XXX. 197 (1916).

SUMATRA, BORNEO.

Lithocarpus omalokos, comb. nov. — *Quercus omalokos* Korthals in Verh. Nat. Geschied. Bot. 214 (1850). — *Cyclobalanus omalokos* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 80, t. 1-2, figs. 15-16 (1866). — *Quercus omalokos* Hooker f., Fl. Brit. Ind. v. 614 (1888). — King in Ann. Bot. Gard. Calcutta, II. 70, t. 63B (1889). — *Pasania omalokos* Schottky in Bot. Jahrb. XLVII. 676 (1912). — *Synaedrys omalokos* Koidzumi in Tokyo Bot. Mag. XXX. 192 (1916.)

SUMATRA.

Lithocarpus ovalis, comb. nov. — *Quercus glabra* Blanco, Fl. Filip. 727 (1837), non Thunberg. — *Quercus ovalis* Blanco, Fl. Filip. ed. 2, 502 (1845). — Merrill in Philip. Jour. Sci. III. Bot. 325 (1908). — *Quercus Blancoi*, A. De Candolle, Prodr. XVI. pt. II. (1864). — Vidal, Sin. Pl. Leñ. Filip. Atl. XLI. t. 92, fig. c (1883). — *Cyclobalanus ovalis* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 81 (1866). — *Quercus induta* Fernandez-Villar, Nov. App. Fl. Filip. 207 (1883), non Blume. — *Quercus Teysmannii* Fernandez-Villar, l. c. (1883), non Blume. — *Synaedrys ovalis* Koidzumi in Tokyo Bot. Mag. XXX. 192 (1916).

PHILIPPINE ISLANDS.

Lithocarpus pachyphylla, comb. nov. — *Quercus pachyphylla* Kurz in Jour. As. Soc. Beng. XLIV. pt. II. 197, t. 14, figs. 1-4 (1875). — King in Ann. Bot. Gard. Calcutta, II. 44, t. 38 (1889). — *Quercus Andersoni* King mscr. apud C. B. Clarke in Jour. Linn. Soc. xv. 125 (1877), nomen. — *Pasania pachyphylla* Schottky in Bot. Jahrb. XLVII. 671 (1912). — *Synaedrys pachyphylla* Koidzumi in Tokyo Bot. Mag. XXX. 197 (1916).

INDIA: Sikkim.

Lithocarpus pallida, comb. nov. — *Quercus pallida* Blume, Bijdr. 524 (1825); Fl. Jav. Cupulif. 12, t. 4, 5 (1828-50). — King in Ann. Bot. Gard. Calcutta, II. 57, t. 53A (1889). — *Quercus pseudo-molucca* var. *rostrata* Blume, Mus. Bot. Lugd.-Bat. I. 295 (1850). — *Quercus pseudo-molucca* var. *pallida* Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 108 (1864-65). — *Synaedrys pallida* Koidzumi in Tokyo Bot. Mag. XXX. 1917 (1916).

JAVA, SUMATRA.

Lithocarpus philippinensis, comb. nov. — *Quercus philippinensis* A. De Candolle, Prodr. XVI. pt. II. 97 (1864). — Merrill in Philip. Jour. Sci. III. Bot. 328 (1908) — *Cyclobalanus philippinensis* Oersted in Naturh. For.

Vidensk. Meddel. xviii. 80 (1866). — *Synaedrys philippinensis* Koidzumi in Tokyo Bot. Mag. xxx. 192 (1916).

PHILIPPINE ISLANDS: LUZON.

Lithocarpus platycarpa, comb. nov. — *Quercus platycarpa* Blume, Fl. Jav. Cupulif. 27, t. 15 (1828-51). — King in Ann. Bot. Gard. Calcutta, ii. 70, t. 65 (1889). — *Cyclobalanus platycarpa* Oersted in Naturh. For. Vidensk. Meddel. xviii. 80 (1866). — *Synaedrys platycarpa* Koidzumi in Tokyo Bot. Mag. xxx. 192 (1916).

JAVA.

Lithocarpus polystachya, comb. nov. — *Quercus polystachya* Wallich, Cat. 2789 (1829), nomen. — A. De Candolle, Prodr. xvi. pt. ii. 107 (1864) — King in Ann. Bot. Gard. Calcutta, ii. 50, t. 44 (1889). — *Quercus bancana* Kurz, For. Fl. Burma, ii. 485 (1877), non Scheffer. — *Pasania polystachya* Schottky in Bot. Jahrb. xlvii. 667, 668 (1912). — *Synaedrys polystachya* Koidzumi in Tokyo Bot. Mag. xxx. 197 (1916).

INDIA: Burma, Shan Hills. CHINA: Yunnan.

Lithocarpus pruinosa, comb. nov. — *Quercus pruinosa* Blume in Verh. Bat. Genoot. ix. 217 (1823); Fl. Jav. Cupulif. 9, t. 1 (1828-51). — King in Ann. Bot. Gard. Calcutta, ii. 56, t. 53B (1889). — *Pasania pruinosa* Oersted in Naturh. For. Vidensk. Meddel. xviii. 83 (1866). — *Quercus pseudo-molucca* var. γ . *pruinosa* Weizig in Jahrb. Bot. Gard. Berlin, iv. 227 (1886). — *Synaedrys pruinosa* Koidzumi in Tokyo Bot. Mag. xxx. 197 (1916).

JAVA.

Lithocarpus pseudo-molucca, comb. nov. — *Quercus pseudo-molucca* Blume in Verh. Bat. Genoot. ix. 214, t. 4 (1823); Fl. Jav. Cupulif. 14, t. 6 (1828-51). — King in Ann. Bot. Gard. Calcutta, ii. 43, t. 36 (1889). — *Quercus angustata* Blume, l. c. 212 (1823); Fl. Jav. Cupulif. 15, t. 7 (1828-51). — *Quercus pseudo-molucca* var. γ . *angustata* Blume, Mus. Bot. Lugd.-Bat. i. 292 (1850). — *Quercus thelecarpa* Miquel in Pl. Junghuhn. i. 9 (1851-56). — *Pasania pseudomolucca* Oersted in Naturh. For. Vidensk. Meddel. xvii. 83 (1866). — *Synaedrys pseudomolucca* Koidzumi in Tokyo Bot. Mag. xxx. 197 (1916).

JAVA.

Lithocarpus pyriformis, comb. nov. — *Quercus pyriformis* Seemen in Bot. Jahrb. xxvii. beibl. lxiv. 17 (1900). — Koorders & Valetton, Bijdr. Booms. Java, x. 62 (1904). — *Synaedrys pyriformis* Koidzumi in Tokyo Bot. Mag. xxx. 198 (1916).

JAVA.

Lithocarpus rassa, comb. nov. — *Quercus rassa* Miquel, Fl. Ind. Bat. Suppl. 350 (1860). — King in Ann. Bot. Gard. Calcutta, ii. 66, t. 60A (1889). — *Synaedrys rassa* Koidzumi in Tokyo Bot. Mag. xxx. 192 (1916).

MALESIA.

Lithocarpus Robinsonii, comb. nov. — *Quercus Robinsonii* Merrill in Philip. Jour. Sci. x. Bot. 297 (1915).

PHILIPPINE ISLANDS: LUZON.

Lithocarpus Skaniana, comb. nov. — *Quercus Skaniana* Dunn in Jour. Linn. Soc. xxxviii. 366 (1908). — *Pasania Skaniana* Schottky in Bot. Jahrb. XLVII. 675 (1912).

CHINA: Fokien.

Lithocarpus Soleriana, comb. nov. — *Quercus molucca* Blanco, Fl. Filip. 726 (1837), non Willdenow. — *Quercus concentrica* Blanco, Fl. Filip. ed. 2, 502 (1845), non Loureiro. — *Quercus costata* var. *convexa* Naves in Blanco, Fl. Filip. ed. 3, t. 441 (1883), non Blume. — *Quercus Reinwardtii* Fernandez-Villar, Nov. App. Fl. Filip. 207 (1883), non Korthals. — *Quercus Soleriana* Vidal, Rev. Pl. Vasc. Filip. 261 (1886). — *Quercus clementiana* Merrill in Philip. Jour. Sci. I. Suppl. 41 (1906), non King. — *Quercus Llanosii* Merrill in Philip. Jour. Sci. II. 270 (1907), non A. De Candolle. — *Synaedrys Soleriana* Koidzumi in Tokyo Bot. Mag. xxx. 193 (1916).

PHILIPPINE ISLANDS.

Lithocarpus spicata (Smith) Rehder & Wilson var. *chittagonga*, comb. nov. — *Quercus spicata* var. *Chittagonga* King in Hooker f., Fl. Brit. Ind. v. 610 (1883; in Ann. Bot. Gard. Calcutta, II. 49, t. 42, fig. 7 (1889)). — *Pasania spicata* var. *chittagonga* Schottky in Bot. Jahrb. XLVII. 665 (1912).

INDIA: Chittagong.

Lithocarpus spicata var. *gracilipes*, comb. nov. — *Quercus gracilipes* Miquel, Fl. Ind. Bat. Suppl. 347 (1860). — *Quercus spicata* d. *gracilipes* Miquel in Ann. Mus. Lugd.-Bat. I. 106 (1864-65). — King in Ann. Bot. Gard. Calcutta, II. 48, t. 42, fig. 4 (1889). — *Pasania spicata* var. *gracilipes* Schottky in Bot. Jahrb. XLVII. 664 (1912).

INDIA: Kashia, Burma. MALESIA.

Lithocarpus submonticola, comb. nov. — *Quercus submonticola* Elmer in Leaf. Philip. Bot. III. 943 (1910).

PHILIPPINE ISLANDS: Mindanao.

Lithocarpus sundaica, comb. nov. — *Quercus sundaica* Blume in Verh. Bat. Genoot. IX. 216 (1823); Fl. Jav. Cupulif. 11, t. 2, 3 (1828-51). — King in Ann. Bot. Gard. Calcutta, II. 51, t. 47, 48 (1889). — *Quercus muricata* Roxburgh, Fl. Ind., ed. 2, III. 635 (1832). — *Quercus mappacea* Korthals in Verh. Nat. Geschied. Bot. 202 (1839-42). — *Quercus Korthalsii* var. *mappacea* Blume, Mus. Bot. Lugd.-Bat. I. 293 (1850). — *Quercus Korthalsii* var. *kajan* Blume, l. c. (1850). — *Quercus Kajan* Miquel msc. apud Zollinger, Syst. Verz. 87 (1854). — *Pasania sundaica* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 83 (1866). — *Quercus pseudo-molucca* var. δ . *Korthalsii* Wenzig in Jahrb. Bot. Gart. Berlin, IV. 227 (1886), pro parte. — *Quercus pseudo-molucca* var. ϵ . *sundaica* Wenzig, l. c. (1886). — *Synaedrys sundaica* Koidzumi in Tokyo Bot. Mag. xxx. 198 (1916).

MALESIA.

Lithocarpus Teysmannii, comb. nov. — *Quercus annulata* Korthals in Verh. Nat. Geschied. Bot. 213, t. 46, figs. 21, 22 (1842), non Smith. — *Quercus Tysmannii* [sic] Blume, Mus. Bot. Lugd.-Bat. I. 300 (1850). — *Quercus Teysmannii* Miquel, Fl. Ind. Bat. I. 850 (1855). — Oudemans in Verh. Akad. Wet. Amsterd. XI. No. 3, 14, t. 8 (Annot. Cupul. Jav.) (1865). —

King in Ann. Bot. Gard. Calcutta, II. 71, t. 66 (1889). — *Quercus Korthalsii* Endlicher, Gen. Suppl. IV. pt. II. 28 (1847), non Blume. — *Quercus laurifolia* Miquel, Pl. Junghuhn. I. 11 (1850), non Michaux. — *Quercus hypoleuca* Miquel, Fl. Ind. Bat. I. 869 (1855). — *Quercus pseudo-annulata* Blume, Mus. Bot. Lugd.-Bat. I. 299 (1855). — *Cyclobalanus Tysmannii* Oersted in Naturh. For. Vidensk. Meddel. XVIII. 80 (1866). — *Pasania Teysmannii* Prantl in Engler & Prantl, Nat. Pflanzenfam. III. 1, 55 (188). — *Synaedrys Teysmani* Koidzumi in Tokyo Bot. Mag. XXX. 193 (1916).

JAVA.

Lithocarpus Thomsonii, comb. nov. — *Quercus Thomsonii* Miquel in Ann. Mus. Bot. Lugd.-Bat. I. 109 (1864-65), nomen. — Hooker f., Fl. Brit. Ind. V. 615 (1888). — King in Ann. Bot. Gard. Calcutta, II. 73, t. 69A (1889). — *Quercus turbinata* Roxburgh, Fl. Ind. ed. 2, III. 636 (1832), non Blume. — *Quercus leucocarpa* Hooker f. & Thomson msc. apud Wenzig in Bot. Jahrb. Bot. Gard. Berlin, IV. 225 (1886). — *Synaedrys Thomsonii* Koidzumi in Tokyo Bot. Mag. XXX. 193 (1916).

INDIA: Kasha, Burma.

Lithocarpus truncata, comb. nov. — *Quercus truncata* King in Ann. Bot. Gard. Calcutta, II. 84, t. 80 (1889). — *Pasania truncata* Schottky in Bot. Jahrb. XLVII. 663 (1912). — *Synaedrys truncata* Koidzumi in Tokyo Bot. Mag. XXX. 190 (1916).

INDIA: Assam.

Lithocarpus uvariifolia, comb. nov. — *Quercus uvariifolia* Hance in Jour. Bot. XXII. 227 (1884). — *Pasania uvariifolia* Hance in Jour. Bot. XXII. 227 (1884). — *Synaedrys uvariifolia* Koidzumi in Tokyo Bot. Mag. XXX. 198 (1916).

CHINA: Kiangsi, Kwantung.

Lithocarpus Wallichiana, comb. nov. — *Quercus Wallichiana* Lindley in Wallich, Cat. No. 2778 (1829). — Hance in Seemann Jour. Bot. VIII. 4 (1870). — King in Ann. Bot. Gard. Calcutta, II. 51, t. 46 (1889). — *Synaedrys Wallichiana* Koidzumi in Tokyo Bot. Mag. XXX. 193 (1916).

MALAY PENINSULA.

Lithocarpus Wenzelii, comb. nov. — *Quercus Wenzelii* Merrill in Philip. Jour. Sci. X. Bot. 267 (1915). — *Synaedrys Wenzelii* Koidzumi in Tokyo Bot. Mag. XXX. 193 (1916).

PHILIPPINE ISLANDS.

Lithocarpus Zschokkei, comb. nov. — *Quercus Zschokkei* Elmer in Leaflet. Philip. Bot. III. 944 (1910).

PHILIPPINE ISLANDS: Mindanao.

Quercus L.

Quercus Ilex L. var. *rotundifolia*, comb. nov. — *Quercus-Ilex Ilex* var. 4 *rotundifolia* Weston, Univ. Bot. I. 234 (1770). — *Quercus rotundifolia* Lamarck, Encycl. Méth. I. 723 (1785). — *Quercus Ballota* Desfontaines in Mém. Acad. Sci. Paris, 1790, 394, t. 6; Fl. Atlant. II. 350 (1800). — *Quercus Ilex* β . *Ballota* A. De Candolle, Prodr. XVI. pt. II. 39 (1864). — *Quercus Ilex* β . *Ballota* B. *rotundifolia* Coutinho in Bol. Soc. Broter. VI. 95 (1888).

There seems little reason to doubt that Weston's variety is the same as *Q. rotundifolia* Lam. and *Q. Ilex* β . *Ballota* A. DC., though the description is very short, but the only form with which it could have been confused is *Q. Ilex* var. *gramuntia* Loudon which is enumerated as a distinct variety by Weston.

Quercus lanuginosa Thuill. var. *Tenorei*, comb. nov. — *Quercus Dalechampii* Tenore, Ind. Sem. Hort. Neap. 1830, 15; Not. Syll. 469 (1831). — Ascherson & Graebner, Syn. Mitteleur. Fl. iv. 478 (1911). — *Q. pinnatifida* K. Koch in Linnaea, xxii. 326 (1849). — *Q. vulcanica* Boissier apud Kotschy, Chênes Eur. Or. t. 18 (1864). — *Q. Robur* Π . *sessiliflora* B. *Tenorei* A. De Candolle, Prodr. xvi. pt. II. 7 (1864). — *Q. sessiliflora* γ . *pinnatifida* Boissier, Fl. Or. iv. 1164 (1879). — *Q. sessiliflora* var. *australis* Kotschy apud Wenzig in Jahrb. Bot. Gart. Berlin, iv. 190 (1886). — *Q. Tergestina* Wenzig, l. c. 191 (1886). — *Q. pubescens* f. *australis* Beck & Szyszyłowicz in Rozpr. Wydz. Mat.-Przyrod. Akad. Krakow. xix. 59 (Pl. Cernag. Alban.) (1888). — *Q. croatica* β . *Tenorei* Pospichal, Fl. Oester, Kuestenl. I. 320 (1897). — *Q. lanuginosa* ζ *pinnatifida* Halacsy, Consp. Fl. Graec. III. 128 (1904), non C. Schneider. — *Q. sessilis* β . *decipiens* f. *australis* Beck, Fl. Bosn. II. 124 (1909). — *Q. Tenorei* Borzi in Boll. Ort. Bot. Palermo, x. 56, t. 4 (1910).

This variety differs from typical *Q. lanuginosa* chiefly in its deeply sinuately lobed leaves with about 5 narrow acute lobes on each side and can hardly be considered specifically distinct from the polymorphous *Q. lanuginosa*.

As the name for the species I have taken up *Q. lanuginosa* Thuillier (1799, not Lamarck 1778 which is a synonym of *Q. Cerris* L.) in preference of *Q. pubescens* Willdenow of 1796, since Willdenow states definitely under *Q. pubescens* in Species plantarum (iv. 450. 1805) that the species described under the same name in 1796 (Berlin. Baumz. 279) is not the same plant as the one described in his Species plantarum, but a variety of *Q. alba* L. which he now calls *Q. alba* γ . *pubescens*. Without this note one may easily be led to identify the *Q. pubescens* of 1796, the habitat of which is given as southern France, with *Q. lanuginosa* of Thuillier, except that Willdenow describes the leaves as attenuate at the base and on the shoots sometimes to 8 inches long, a size never attained by the leaves of *Q. lanuginosa*. It is, however, not quite clear what his *Q. alba* γ . *pubescens* really is, possibly a form of *Q. bicolor*.

× *Quercus hispanica* Lamarck, Encycl. Méth. I. 712 (1783), excl. var. γ . — (*Q. Cerris* × *Suber*). — *Q. pseudosuber* Santi, Viaggio Mont'Am. I. 156, t. 3 (1795). — Kotschy, Chênes Eur. Or. t. 35 (1864). — Ascherson & Graebner, Syn. Mitteleur. Fl. iv. 463 (1911). — *Q. Fontanesii* Gussone Ind. Sem. Hort. Boccadifalco, 10 (1826). — *Q. Ilex* var. *suberosa* Visiani, Fl. Dalmat. I. 208 (1842). — *Q. pseudosuber* 2. *Fontanesii* Loudon, Encycl. Trees, 885, fig. 1624 (1842). — *Q. Cerris* ϵ . *subperennis* A. De Candolle, Prodr. xvi. pt. II. 42 (1864).

Lamarck based his *Q. hispanica* on three different trees of unknown origin cultivated in the park of Trianon near Paris. The first two forms called α . Chêne de Gibraltar and β . Chêne à feuilles d'Aegylops are apparently identical with the Fulham and Lucombe Oaks of English gardens which originated about 1765 and are undoubtedly hybrids between *Q. Cerris* L. and *Q. Suber* L. The third form called γ . turnère is *Q. Turneri* Willd. probably a hybrid between *Q. Ilex* and *Q. robur*. The *Q. pseudosuber* of Santi of which I have seen numerous specimens from different localities I am unable to distinguish from the cultivated forms of the hybrid between *Q. Cerris* and *Q. suber*. It seems to occur in southern Europe only in scattered individuals in regions where *Q. Cerris* is native and where *Q. suber* is found either wild or cultivated; e.g. near Pola, Istria, where *Q. pseudosuber* has been observed, old trees of *Q. suber* exist, as stated by Hempel & Wilhelm (Bäume & Sträuch. II. 82). Even if *Q. pseudosuber* should be found in localities where at present no cultivated trees of *Q. suber* exist, this would be no proof against its hybrid origin, as trees of *Q. suber* may have existed and succumbed to a severe winter, while the hybrid which is more resistant has survived.

Several distinct forms of this hybrid occur in cultivation of which the following are the most distinct and best known. To avoid confusion I have preserved for the typical form its oldest varietal name.

× *Q. hispanica* var. *dentata*, comb. nov. — *Q. hispanica* α . "Chêne de Gibraltar" Lamarck, Encycl. Méth. I. 712 (1783). — *Q. Cerris* var. *dentata* Watson, Dendr. Brit. II. t. 93 (1825). — *Q. Cerris* 8. *fulhamensis* Loudon, Arb. Brit. III. 1850, fig. 1710 (1838). — *Q. pseudosuber* ϵ . *gibraltarica* A. De Candolle, Prodr. XVI. pt. II. 44 (1864). — *Q. Cerris* ϵ . *subperennis* α . *Fulhamensis* Dippel, Handb. Laubh. II. 96 (1892). — *Q. fulhamensis* Zabel in Beissner, Schelle & Zabel, Handb. 70 (1903). — *Q. Lucombeana* var. α . *fulhamensis* Henry in Elwes & Henry, Trees Gt. Brit. v. 1261, t. 335, fig. 21 (1910).

This form is chiefly characterized by its pyramidal habit with moderately corky branches, by its generally elliptic-ovate leaves with 5–8 teeth, and by the hemispheric cup with the scales usually all reflexed. It is the typical form and is not identical with *Q. Cerris Lucombeana dentata* Loud. (*Q. Lucombeana* var. *dentata* Henry).

× *Q. hispanica* var. *latifolia*, comb. nov. — *Q. Lucombeana* var. *fulhamensis latifolia* Henry in Elwes & Henry, Trees Gt. Brit. v. 1262 (1910). — *Q. fulhamensis latifolia* Hort. ex Henry, l. c., pro synonym.

This form differs from the preceding chiefly in its broader, less strongly dentate leaves.

× *Q. hispanica* var. *Lucombeana*, comb. nov. — *Q. hispanica* β . "Chêne à feuilles d'Aegylops" Lamarck, Encycl. Méth. I. 723 (1783). — *Q. aegylopifolia* Persoon, Syn. II. 570 (1807). — *Q. Lucombeana* Sweet, Hort. Brit. 370 (1827). — Henry in Elwes & Henry, Trees Gt. Brit. v. 1259, t. 335, fig. 23 (1910). — *Q. Cerris* var. *Lucombeana* Loudon, Arb. Brit. III. 1851, figs. 1711–14 (1838). — *Q. exoniensis* Loddiges ex Loudon, l. c., pro synonym. —

Q. pseudosuber δ . *aegylopiifolia* A. De Candolle, Prodr. xvi. pt. II. 44 (1864). — *Q. Cerris* e. *subperennis* β . *Lucombeana* Dippel, Handb. Laubh. II. 97 (1892). — *Q. fulhamensis Lucombeana* Zabel in Beissner, Schelle & Zabel, Handb. 71 (1903).

This variety forms a round-headed tree with the bark not corky; the leaves are narrower and longer than in the typical form and have about 7 pairs of triangular large teeth; the subulate scales of the turbinate cup are partly reflexed and partly erect.

× *Q. hispanica* var. *crispa*, comb. nov. — *Q. Cerris* 10. *Lucombeana crispa* Loudon, Arb. Brit. III. 1856 figs. 1715, 1717c, 1718 (1838). — *Q. Lucombeana* var. *crispa* Henry in Elwes & Henry, Trees Gt. Brit. v. 1261 (1910).

This differs from the preceding variety chiefly in the very corky bark and in the smaller leaves with wrinkled margin.

× *Q. hispanica* var. *heterophylla*, comb. nov. — *Q. Cerris* 14. *heterophylla* Loudon, Arb. Brit. III. 1857, fig. 1719 (1838). — *Q. Lucombeana* var. *heterophylla* Henry in Elwes & Henry, Trees Gt. Brit. v., 1261 (1838).

Leaves oblong, irregularly and deeply lobed, in the middle often with a deep wide sinus on each side leaving only a narrow margin at the midrib.

× *Q. hispanica* var. *diversifolia*, comb. nov. — *Q. Ilex* var. *diversifolia* Hort. apud Nicholson, Hand-list Arb. Kew, II. 189 (1896). — *Q. Lucombeana* var. *diversifolia* Henry in Elwes & Henry, Trees Gt. Brit. v. 1262, t. 339, fig. 71 (1910).

The leaves are somewhat similar to those of the preceding form, but are smaller; the cup of the fruit is hemispheric with shorter partly appressed scales; the branches ascending, the bark corky.

Quercus sessiliflora Salisb. f. *insecata*, nom. nov. — *Q. sessiliflora* γ . *laciniata* Koehne, Dendr. 130 (1893), not Duchartre. — Spaeth in Mitt. Deutsch. Dendr. Ges. XXII. 138, figs. 18–20 (1913).

This is a peculiar form with deeply incisely lobed leaves, the narrow lobes pointing forward. It had to receive a new name on account of the older homonym *Q. sessiliflora laciniata* DC. apud Duchartre in Jacques & Héring, Man. Pl. IV. 254 (1857) which is probably the same as *Q. robur* β . *laciniata* Lamarck, Encycl. Méth. I. 717 (1785) and represents a form with deeply lobed leaves, but otherwise similar to those of the type.

Quercus robur f. *holophylla*, nom. nov. — *Q. sessiliflora longifolia* Jurrissen & Zoon, Prijs-Cour. 49 [190.?], nomen. — *Q. pedunculata* var. *longifolia* Bean, Trees & Shrubs, II. 321 (1914), not Kirchner.

This very distinct and peculiar form differs from the type in its elliptic to oblong entire leaves obtuse at apex and auricled at base; the fruits are borne on a very long and slender stalk. Nothing is known to me of its origin; it was received at the Arnold Arboretum in 1903 from the nursery of Jac. Jurrissen & Zoon of Naarden, Holland. The form had to receive a new name on account of the older *Q. pedunculata* α . *cucullata longifolia* Kirchner in Petzold & Kirchner, Arb. Musc. 622 (1864) (*Q. robur* var. *cucullata longifolia* Hartweg & Rümpler, Bäum. Sträuch. 440 1875).

Quercus aliena Bl. var. **pubipes**, var. nov.

A typo praecipue differt foliis minoribus latioribus subtus pilis fasciculaist suberectis ad costam nervosque densius in facie sparsius obsitae, petiolis pubescentibus circiter 1 cm. longis, ramulis novellis parce strigoso-pilosis. — Folia obovata, 7–10 cm. longa et 4–8 cm. lata, obtuse dentata dentibus utrinque 8–10, supra opace cyaneo-viridia, fere glabra, subtus cinereo-viridia, molliter pubescentia.

CHINA. Chikung-shan, border of Honan and Hupeh, alt. 1500–2500 feet, low shrub, 3–4 feet, June 13, 1917, *L. H. Bailey*.

Though the specimen before me is sterile I have little doubt that it belongs to *Q. aliena* Blume from the typical form of which it differs, however, markedly in the sparingly pilose branchlets, in the pubescent petioles and in the grayish and soft pubescence of the under side of its leaves, particularly dense on the midrib and on the nerves which are quite glabrous in the typical form, while the surface is covered by a whitish dense tomentum. On account of the broadly obovate grayish pubescent leaves this variety has the appearance of a small-leaved form of *Q. dentata* Thunberg, but that species is easily distinguished by the tomentose branchlets and by the nearly sessile more coarsely toothed and usually very large leaves.

In the same locality Dr. Bailey collected a specimen of *Q. aliena* which has the under side of the leaves nearly glabrous or only sparingly pubescent and which I refer to *Q. aliena* var. *pellucida* Blume. To the same variety apparently belong specimens collected by Dr. Bailey near Kioshan in the province of Honan of which one is remarkable for its slender petioles 2–3 cm. long and for the auricled base of the leaves which are 9–15 cm. long.

Quercus dentata Thunberg.

Though Thunberg's description of *Q. dentata* can hardly be applied to any other species than the one generally known under that name, a glance at his figure in his *Icones Plant. Jap.* v. t. [6] creates a suspicion that Thunberg's species may possibly not be our *Q. dentata*. The branch represented in that plate looks much more like *Q. aliena* var. *acuteserrata* Maximowicz than our *Q. dentata*. Upon my request Professor O. Juel has kindly sent an excellent photograph of Thunberg's type consisting of a flowering branch with half-grown leaves and tells me that this specimen is the only one labeled *Q. dentata* in Thunberg's own handwriting. The photograph shows that the specimen represents without the slightest doubt our *Q. dentata*, but as the leaves are only half-grown, they have not yet reached their full width and their uncompletely developed lobes look more like acutish teeth. In comparing the photograph with the plate one readily sees that the drawing has been based on this specimen, but the artist apparently took many liberties particularly in representing the leaves as distinctly petioled and the lobes of the leaves as more acute and more regular than they really are, and in selecting as the type for the leaves the narrowest of the half-grown leaves, neglecting entirely the more developed broader leaves on the specimen.

ULMACEAE

Ulmus glabra f. *cornuta*, comb. nov. — *U. campestris cornuta* David in Rev. Hort. ser. 2, IV. 102 (1845-46). — *U. triserrata* Hort. apud Kirchner in Petzold & Kirchner, Arb. Musc. 567 (1864). — *U. intermedia* Hort. ex Kirchner, l. c., as synonym. — *U. scabra* e. *U. tricuspis* K. Koch, Dendr. II. pt. I. 415 (1872). — *U. tridens* Hort. ex Koch, l. c., as synonym. — *U. montana* var. *triserrata* Lavallée, Arb. Segrez. 237 (1877). — *U. montana* var. *tridens* Lange, Haandb. Dansk. Fl. 267 (1887). — *U. scabra* f. *tricuspis* Dippel, Handb. II. 29 (1892). — *U. montana* f. *lobata* Waisbecker in Oestr. Bot. Zeitschr. XLIX. 67 (1899). — *U. montana* ? *tricuspis* Schelle in Beissner, Schelle & Zabel, Handb. 86 (1903). — *U. scabra* f. *heterophylla* Schneider, Handb. Laubh. I. 218 (1904), pro parte. — *U. montana* a. *corylifolia* Zapałowicz, Consp. Fl. Galic. II. 98 (1908). — *U. glabra* f. *tricuspis* Rehder in Mitt. Deutsch. Dendr. Ges. XXIV. (1915) 216 (1916).

This form has large leaves which are partly, at least at the ends of the more vigorous branches, 3- or sometimes 5-lobed at the broad apex. It has usually been confused with *U. laciniata* Mayr (*U. major* var. *heterophylla* Maxim. & Rupr.), a species of Eastern Asia, chiefly distinguished by its light colored branchlets and by the leaves which are nearly all 3-lobed at the apex, such leaves not being confined to the end of the more vigorous branches, as in this form of *U. glabra*.

Ulmus laciniata Mayr var. *nikkoensis*, var. nov.

A typo praecipue recedit foliis minoribus latioribus subtus sparse pubescentibus junioribus plus minusve purpurascensibus. — Folia late obovata apice plerumque triloba, 6-11 cm. longa, subtus scabrida pilis brevibus satis sparsis in costa et nervis venulisque, ceterum glabra; ramuli annotini fusco-cinerei.

JAPAN. Hondo; Nikko region, Lake Chuzenji, alt. 1600 m., plants collected by J. G. Jack, October, 1905, and growing now in the Arnold Arboretum.

This variety differs chiefly in its smaller, usually broadly obovate leaves rather sparingly short-pubescent on the nerves and veinlets beneath and scabrid to the touch, while in the typical form the under side of the leaves is covered by a grayish rather dense and soft pubescence and the leaves are oftener oblong-obovate and usually more than 10 cm., often to 15 cm. long. According to our growing plants the variety forms a smaller tree of slenderer habit particularly striking in spring on account of the purplish color of the unfolding leaves which is retained a long time and changed in summer to dark green, while the leaves of the typical form are light green when unfolding.

I have seen no herbarium material of *U. laciniata* from Hondo, but according to Japanese botanists it occurs in central Japan. The specimens from Hokkaido I have seen belong to the typical form and agree with specimens from Manchuria.

Ulmus procera Salisbury, Prodr. Stirp. Allerton, 391 (1796). — *Ulmus campestris* Linnaeus, Spec. i. 225 (1753), pro parte.; Fl. Angl. 11 (1754). — Miller, Dict. ed. viii. No. 1 (1768).¹ — Weston, Univ. Bot. i. 314 (1770). — Henry in Elwes & Henry, Trees Gt. Brit. vii. 1903, t. 412, fig. 14 & t. 396 (1913). — Moss in Gard. Chron. ser. 3, LI 199 (1912); Cambridge Brit. F. II. 94, t. 102 (1914). — *U. campestris a. vulgaris* Solander apud Aiton, Hort. Kew. i. 319 (1789). — Planchon in Ann. Sci. Nat. sér. 3, x. 273 (1848); in De Candolle, Prodr. xvii. 156 (1873). — *U. suberosa* Smith, Engl. Bot. xxxi. t. 2161 (1810), non Ehrhart, nec Moench. — *U. atinia* Walker, Essays Nat. Hist. 70 (1812). — *U. surculosa* var. *latifolia* Stokes, Mat. Med. II. 37 (1812). — *U. vulgaris* Dumortier, Fl. Belg. 25 (1827). — *U. suberosa* var. *vulgaris* Hooker & Arnott, Brit. Fl. 376 (1850), ex parte. — *U. germanica* Hartig, Forstl. Kulturpfl. 460 (1851). — *U. campestris* var. *major* Trautvetter in Bull. Acad. Sci. St. Petersburg. xv. 351 (1857), pro parte, non Walpers. — *U. campestris a. vulgatissima* Miller apud Boulger in Gard. Chron. n. ser. XII. 298 (1897). — *U. glabra* b. *pilifera* Borbas, Bekesvarmeg. Fl. 55 (1881). — *U. pilifera* Borbas, Közl. Bekesvarmeg. Fl. in Vandorg. Munkal. xxv. (486) (1881), ex Ascherson & Graebner. — *U. asperrima* Nagi, Varad. Termesz. 124 (1890). — *U. campestris β. germanica* f. *pubescens* Pospichal, Fl. Oester. Kuestenl. i. 347 (1897). — *U. glabra* Mill. b. *pubescens* Schneider, Ill. Handb. i. 220 (1904). — *U. surculosa* Ley in Jour. Bot. XLVIII. (1910). — *U. campestris a. latifolia* l. *pubescens* Ascherson & Graebner, Syn. Mitteleur. Fl. IV. 557 (1911).²

The correct name for this species which had been confused by many authors with *U. foliacea* Gilib. (*U. glabra* Mill., non Huds., *U. nitens* Moench) has been a matter of much dispute. There can be no doubt that like the other European species it formed a part of Linnaeus' *U. campestris*, but to consider it the type of that species is certainly not correct. If we try to ascertain the type of *U. campestris* L., we should turn for a clue first to the citations of Linnaeus in his own publications. The first citation in the Species plantarum is Hort. Cliffort. 83; where we find under *Ulmus fructu membranaceo* three varieties "α, β, γ" enumerated; the first which must be considered the type of this aggregate is "α. *Ulmus folio latissimo scabro* Tournefort" which is *U. glabra* Hudson; also the following citation Fl. Suec. 219 must refer to *U. glabra* Huds., as this is the only or at least the most widely distributed species in Sweden; this is confirmed by the figure in Svensk Botanik by Palmstuch & Venus (1802) where the species figured as *U. campestris* on plate 13 represents *U. glabra*

¹ Henry refers *Ulmus campestris* Miller to *U. montana* With. (= *U. glabra* Hudson), but Miller describes that species under the name *U. scabris* to which he ascribes leaves six inches long, while of his *U. campestris* he says that the leaves are about 3 inches long and come out late, which is true of *U. procera* as compared with *U. glabra* Hudson. Furthermore it is most likely that Miller's *U. campestris* is the same species as the *U. campestris* of his contemporaries Weston and Solander; this is also the opinion of Moss.

² Ascherson & Graebner cite as a synonym *Ulmus campestris* var. *pubescens* Planchon in De Candolle, Prodr. xvii. 156, but no such combination can be found there; the word *pubescens* is the beginning of the description; they also cite Ann. Sci. Nat. 3, sér. "III" [IX] where no reference at all to a pubescent form occurs.

Huds., and also by the material in our herbarium. The third citation Mat. Med. 105 refers without doubt to the same species, as he gives Europae nostrae pagi as the habitat. A further proof that Linnaeus had *H. glabra* Huds. in mind, is the fact that he places the genus in Pentandria, the native *U. glabra* being probably the only species of which he had examined the flowers; if he had examined *U. procera*, he ought to have placed the genus in Tetrandria. Finally may be added that the specimen of *U. campestris* in Linnaeus' herbarium represents *U. glabra* Huds., though this is no conclusive evidence, as the specimen in this case is not the type of his species. All this shows, that if we restrict *U. campestris* L. to one of the species now recognized, it must be considered the oldest name for *U. glabra* Hudson, but it is probably better to take advantage of art. 51. 4 of the International Code and let the name lapse, as it would make the nomenclature of *Ulmus* still more confused than it is already. The reason advanced by Moss and by Henry for restricting the name *U. campestris* to *U. procera* is the fact that Linnaeus in his *Flora Anglica* (p. 11), published one year after the *Species plantarum*, cites under *U. campestris* a reference to Ray's *Synopsis* 468-1; this reads in Ray's work "1. *Ulmus vulgatissima folio lato scabro*" which is *U. procera*. Whatever the reason may have been to omit *Ulmus* 2-4 of Ray's *Synopsis*, it was certainly not the intention of Linnaeus to change his conception of *U. campestris*, for in the second edition of his *Species plantarum* he did not make the slightest change in the wording of the diagnosis or of the citations. The type of a species, moreover, cannot be changed by any subsequent publication, and moreover the *Flora anglica* is a simple compilation containing only the bare names followed by a reference to Ray's *Synopsis*, and is without the slightest taxonomic importance. If we follow Henry *Ulmus sativa* Mill. would be the next oldest name, but this view is not shared by Moss who takes up *U. sativa* as the oldest name for the species called by Henry *U. minor* Mill., and I am more inclined to follow Moss. Miller's citation under *U. sativus* certainly favors the opinion of Moss. Miller in his description says little, but under his *U. campestris* states that "the branches do not grow as erect as those of the third sort" (= *U. sativus*), this might point to the Cornish Elm which is not mentioned otherwise by Miller, but according to Weston was in cultivation at that time. In any case the status of *U. sativus* Mill. is rather doubtful, while *Ulmus procera* of Salisbury is based exclusively on *U. campestris a. vulgaris* Solander which is the *Ulmus vulgatissima folio lato scabro* of Gerard and without doubt the species known at present as the English Elm.

Ulmus procera f. *argenteo-variegata*, comb. nov. — *U. campestris* 2. *argenteo-variegata* Weston, Bot. Univ. I. 314 (1770). — *U. campestris* var. *foliis variegatis* Loddiges apud Loudon, Arb. Brit. III. 1376 (1838). — *U. campestris a. vulgarissima* 1. *variegata* (Loud.) Boulger in Gard. Chron. n. ser. XII. 298 (1879). — *U. campestris* var. *variegata* Dippel, Handb. Laubh. II. 25 (1892).

Weston's *U. campestris argenteo-variegata* is certainly referable to this

species as he characterized his *U. campestris* as *U. vulgatissima foliis latis scabris*.

Ulmus procera f. *purpurea*, comb. nov. — *Ulmus campestris* var. *purpurea* H. Vilv. apud Wesmael in Bull. Fed. Soc. Hort. Belg. 1862, 390 (1863). — *U. campestris* 17. *purpurea* Kirchner in Petzold & Kirchner, Arb. Musc. 557 (1864). — *U. purpurea* Hort. ex Kirchner, l. c., as synonym.

Ulmus procera f. *purpurascens*, comb. nov. — *U. campestris myrtifolia purpurea* De Smet, Cat. No. 10, 59 (1877), not *U. campestris* var. *purpurea* Wesmael. — ? *U. campestris* var. *purpurascens* Lavallée, Arb. Segrez. 236 (1877), nomen. — *U. glabra* Mill. var. *pubescens* f. *purpurascens* Schneider, Ill. Handb. I. 220 (1904). — *U. campestris* a. *latifolia* l. *pubescens* c. *Berardii* lus. *purpurascens* Ascherson & Graebner, Syn. Mitteleur. Fl. IV. 558 (1911). — *U. campestris* var. *purpurascens* Henry in Elwes & Henry, Trees Gt. Brit. VII. 1905 (1913).

Ulmus procera, f. *Vanhouttei*, comb. nov. — *U. campestris* "Louis Van Houtte" Deegen in Ill. Monatsh. Gartenb. v. 103 (1886). — *U. montana lutescens Vanhouttei* Schelle in Beissner, Schelle & Zabel, Handb. 86 (1903). — *U. glabra* Mill. var. *pubescens* f. *van houttei* Schneider, Ill. Handb. I. 220 (1904). — *U. campestris* a. *latifolia* l. *pubescens* c. *Berardii* lus. *Van Houttei* Ascherson & Graebner, Syn. Mitteleur. Fl. IV. 558 (1911). — *U. campestris* var. *Vanhouttei* Henry in Elwes & Henry, Trees Gt. Brit. VII. 1905 (1912).

Ulmus procera var. *Berardii*, comb. nov. — *U. campestris* var. *Berardii* Simon-Louis, Cat. 1869, p. 96, fig. 7. — Carrière in Rev. Hort. 1873, 340. — *U. glabra* Mill. var. *pubescens* f. *berardii* Schneider, Ill. Handb. I. 220, figs. 136 1–m. (1904). — *U. campestris* a. *latifolia* l. *pubescens* c. *Berardi* Ascherson & Graebner, Syn. Mitteleur. Fl. IV. 558 (1911). — *U. nitens* var. *Berardi* Bean, Trees & Shrubs, II. 618 (1914).

This variety approaches in its nearly glabrous leaves *U. foliacea* Gilib., but the petioles and the young branchlets are pubescent. Flowers and fruits are yet unknown.

Ulmus procera var. *viminalis*, comb. nov. — *U. campestris* var. *viminalis* Loudon, Arb. Brit. III. 1376, VII. t. 185a (1838). — *U. viminalis* Loddiges ex Loudon, l. c., pro synonym. — K. Koch, Dendr. II. pt. I. 418 (1872), pro forma *U. scabrae*. — *U. antarctica* Hort. apud Kirchner in Petzold & Kirchner, Arb. Musc. 551 (1864). — *U. gracilis* Hort. ex Kirchner, l. c., pro synonym. — *U. campestris* a. *vulgatissima* 3. *viminalis* Masters apud Boulger in Gard. Chron. n. ser. XII. 298 (1879). — *U. campestris* var. *gracilis* Hartwig & Rümpler, Bäum. Sträuch 580 (1879). — *U. scabra* var. *viminalis* Dippel, Handb. Laubh. II. 30 (1892). — *U. scabra* f. *major viminalis* Voss, Vilmorin's Blumengaert. ed. 3, I. 906 (1895). — *U. montana* var. *viminalis* f. *gracilis* Baenitz, Herb. Dendr. (1901), in sched. — *U. montana viminalis* Schelle in Beissner, Schelle & Zabel, Handb. 85 (1903). — *U. montana viminalis gracilis* Schelle, l. c. (1903). — *U. glabra* Mill. var. *pendula* f. *viminalis* Schneider, Ill. Handb. I. 220, fig. 136 n (1904). — *U. glabra* var. *pendula* f. *antarctica* Schneider, l. c. fig. 136 o (1904). — *U. campestris* a.

glabra a. *vulgaris* lus. *viminalis* Ascherson & Graebner, Syn. Mitteleur. Fl. iv. 554 (1911). — *U. campestris* a. *glabra* a. *vulgaris* lus. *antarctica* Ascherson & Graebner, l. c. (1911). — *U. viminalis* Loddiges apud Bean, Trees & Shrubs, II. 621 (1914).

The form named *gracilis* (*antarctica*) has been distinguished from *viminalis* by the more deeply incised usually obovate leaves, but the two forms of leaves pass gradually into each other and may be found even on the same plant.

Ulmus procera var. *viminalis* f. *aurea*, comb. nov. — *U. campestris* var. *aurea* Morren in Belg. Hort. xvi. t. 356–57 (1866). — Lemaire in Ill. Hort. xiv. t. 513 (1867). — *U. Rosseelsi* K. Koch, Dendr. II. pt. I. 412 (1872), pro forma *U. scabrae*. — *U. campestris* var. *antarctica aurea* Nicholson, Hand-list Arb. Kew, II. 135 (1896). — *U. montana viminalis gracilis aurea* Schelle in Beissner, Schelle & Zabel, Handb. 86 (1903). — *U. campestris Rosscelsii* [sic] Schelle, l. c. 83 (1903). — *U. campestris* var. *viminalis aurea* Henry in Elwes & Henry, Trees Gt. Brit. VII. 1907 (1913). — *U. viminalis* var. *aurea* Bean, Trees & Shrubs, II. 621 (1914).

Ulmus procera var. *viminalis* f. *marginata*, comb. nov. — *U. campestris* 14. *viminalis marginata* Hort. apud Kirchner in Petzold & Kirchner, Arb. Musc. 556 (1864). — *U. campestris* var. *viminalis variegata* Nicholson, Hand-list Arb. Kew, II. 137 (1896). — *U. montana viminalis marginata* Schelle in Beissner, Schelle & Zabel, Handb. 85 (1903). — *U. viminalis* var. *variegata* Bean, Trees & Shrubs, II. 621 (1914).

Ulmus procera var. *australis*, comb. nov. — *U. campestris* var. *australis* Henry in Elwes & Henry, Trees Gt. Brit. 1904, t. 412, fig. 17 (1910).

Ulmus pumila L. var. *pilosa* Rehder, var. nov.

A typo recedit ramulis junioribus rubro-brunneis dense pilosis pilis patulis, tomento ad tertium annum persistente, foliis junioribus supra pilis accumbenti-setulosis scabra, subtus ad costam et nervos pilosis, petiolis brevibus pilosis. — Arbor 10-metralis: folia elliptico-ovata, acuminata, subsimpliciter serrata, 2–3.5 cm. longa; petioli 1–2 mm. longi, pilosuli: samara brevissime pedicellata, suborbicularia vel rotundato-ovalia, 12–14 mm. longa et 10–12 mm. lata, apice profunde emarginata, sinus lateribus valde curvatis et sese tegentibus.

CHINA. Yunnan: Pe-yen-tsin, May 7, 1916, *Siméon Ten* (No. 89, ramuli foliiferi, type); March 1, 1917, *Siméon Ten* (No. 307, ramuli fructiferi).

This variety agrees in size and shape of leaf and fruit exactly with typical *U. pumila*, but differs in the dense pilose pubescence and in the reddish brown color of the young branchlets and in the pubescence of the leaves and their short petioles. Typical *U. pumila* as a rule is quite glabrous and the only specimens with pubescent branchlets I have seen are F. N. Meyer's No. 928, a specimen collected by Purdom near Peking, and Wilson's No. 1565 from Kiangsi, but the pubescence of the first two of these specimens is minutely villous and not at all pilose, while Wilson's specimen has

the branchlets sparingly pilose; Meyer's specimen approaches our variety also in the red-brown color of the branchlets and in the very short petioles.

Ulmus pumila has not before been recorded from Yunnan, but I suspect that the Elm enumerated by Lévillé in his *Cat. Pl. Yun-Nan*, p. 276 (1917) as *U. parvifolia* Jacquin is this new variety.

***Zelkova serrata* Makino**

CHINA. Hunan: prope urbem Wukang, in silva frondosa elata umbrosa montis Yun-shan, alt. 1000 m., August 7, 1917, *H. v. Handel-Mazzetti*, No. 399 (Diar. No. 2204).

The material in the Arboretum herbarium from China proper, formerly referred to *Zelkova serrata* (*Z. acuminata* Planch.) has been found to belong to *Zelkova sinica* Schneider (in Sargent, *Pl. Wilson*. III. 286 [1916]). We therefore concluded that *Z. serrata* is restricted to Japan and Korea. The specimen cited above, however, which is undoubtedly true *Z. serrata*, as it agrees exactly with specimens from Japan proves that *Z. serrata* extends far into southern China; Wukang being situated in the southwestern part of Hunan not very far from the border of Kwangsi.

Zelkova sinica is apparently a species of more northern distribution, ranging from Shansi to Kansu and south to Hupeh and northern Chekiang. To which species Carles' specimen from Tahoe Lake in Chekiang cited by Hemsley belongs I am unable to say, as I have not seen it.

MORACEAE

***Morus mongolica* Schneid. var. *vestita* var. nov.**

A typo recedit foliis supra satis dense setuloso-pubescentibus, subtus dense molliter villosis; petiolis pedunculisque villosulis.

CHINA. Yunnan: Sou-pin-chao via Pe-yen-tsin ad Pien-kio, April 20, 1917, *Siméon Ten* (No. 321; arbor 5-10 m. altus, floribus albis, typus); "rochers des couteaux à Pan-pien-kai," alt. 2500 m. May, 1912, *E. E. Maire*.

These specimens agree in all characters exactly with typical *M. mongolica* except in the pubescence of the leaves and of the peduncles which are glabrous or nearly glabrous in the type.

BERBERIDACEAE

***Mahonia repens* f. *subcordata*, f. nov.**

A typo recedit foliolis 5-7, rarius 9, approximatis late ovatis basi subcordatis, dentibus paucis remotis fere ad mucronem reductis interdum fere integris.

Cultivated at Highland Park, Rochester, N.Y. (Type specimen coll. May 10-11, 1913, by *R. E. Horsey* & *J. Bishop*, preserved in the Arnold Arboretum Herb.)

This is a rather distinct looking form characterized by the 5-9-foliate leaves with broad and crowded leaflets partly overlapping at the subcordate base.

× ***Mahonia Wagneri***, comb. nov. — (*M. Aquifolium* × *pinnata*. — *Maho-*

nia pinnata var. *Wagneri* Jouin in Mitt. Deutsch. Dend. Ges. XIX. 90, fig. 290 (1910). — Fedde, Rep. Spec. Nov. XIII. 364 (1914). — *Berberis pinnati* var. *Wagneri* Rehder in Mitt. Deutsch. Dendr. Ges. XXI. 184 (1912).

This hybrid resembles in its habit and in the axillary inflorescences *M. pinnata* Fedde, but the leaflets are thinner and slightly lustrous and the petioles are slenderer, often attaining 3 cm. in length, while on other parts of the same plant they may be scarcely 5 mm. long; the usually 9 or 11 leaflets are mostly ovate-lanceolate and sinuately dentate with 4 or 5 spiny teeth on each side. *Mahonia Wagneri* is about as hardy as *M. Aquifolium*, but grows much taller, reaching a height of 2.5. m. When and where it originated is not known; it has been in cultivation in the Nursery of Simon-Louis Frères at Plantières near Metz since 1863. In gardens it is sometimes found under the name of *M. fascicularis*.

CALYCANTHACEAE

Calycanthus fertilis var. *ferax*, comb. nov. — *C. ferax* Michaux, Fl. Bor.-Am. I. 305 (1803). — *C. laevigatus* Willdenow, Enum. Pl. Hort. Berol. 559 (1809). — *C. pennsylvanicus* Loddiges ex Loudon, Arb. Brit. II. 937 (1838), pro synonym. — *Butneria nana* Small, Fl. S. E. U. S. 528 (1903), pro parte. *Butneria fertilis* b. *ferax* Schneider, Ill. Handb. I. 344 (1905). — *Calycanthus fertilis* var. *laevigatus* Bean, Trees & Shrubs, I. 283 (1914).

This variety differs chiefly in the green under side of the leaves which is glaucous in typical *C. fertilis*. The closely related *C. fertilis* var. *nanus* Schelle (*C. nanus* Lois.) is likewise green on the under side of the leaves, but smaller in every part.

LAURACEAE

Umbellularia californica Nutt. f. *pendula*, nom. nov. — *U. californica* "pendulous form" Jepson, Silv. Cal. 243, t. 76 (1900).

Near Olema, Marin Co. and northward, according to Jepson.

A tree with wide-spreading branches forming a crown broader than high and with slender pendulous branchlets. A very ornamental form to be recommended for cultivation.

Litsea sericea Hooker f., Fl. Brit. Ind. v. 156 (1886). — Gamble in Sargent, Pl. Wilson. II. 75 (1914). — *Tetranthera sericea* Wallich, Cat. No. 2545 (1829), nomen. — Nees in Wallich, Pl. As. Rar. II. 67 (1831). — *Tetranthera sikkimensis* Meissner in De Candolle, Prodr. xv. pt. I. 181 (1864). — *Lindera umbellata* Hemsley in Jour. Linn. Soc. XXVI. 393 (1891), pro parte, non Thunberg. — Gamble in Sargent, Pl. Wilson. II. 81 (1914). — *Lindera membranacea* Hemsley, l. c. 389 (1891), pro parte, non Maximowicz. — Gamble, l. c. (1914).

The Chinese specimens referred to *Lindera umbellata* and *L. membranacea* by Hemsley and Gamble, as far as I have seen them, belong to *Litsea* except a specimen from Ningpo which may be true *Benzoin umbellatum*, and except Wilson's No. 1634 from Kiangsi and his No. 3675 from Szechuan

which may or may not belong to *Litsea*. The flowering specimens have 4-celled anthers which is the chief character in which *Litsea* differs from *Benzoin* with 2-celled anthers. The specimens agree very well with *L. sericea* Hook. f.; the only difference I find is that Hooker attributes 12 stamens to this species, but as Meissner says that the number may vary in one and the same species from 9 to 12 and as the specimens referred by Gamble to *Litsea sericea* have only 9 stamens, I do not think that this is a specific difference. The specimens show considerable variation in the pubescence of the under side of the leaves; in some specimens they are densely silky pubescent beneath (Wilson's Nos. 3678, 3671, 3681, referred by Gamble to *Lindera membranacea*) while others are glabrescent at maturity (Wilson's Nos. 3673, 3680 and 3684 referred by Gamble to *L. umbellata*). The glabrescent and pubescent forms look quite distinct and may be worthy of varietal rank, but as I have seen neither the type of *L. sericea* nor sufficient Himalayan material, I do not feel justified to propose a new variety. Where Gamble's *Lindera umbellata* var. *latifolia* belongs, I do not know, as I have not seen it. Possibly *Litsea Veitchiana* Gamble is only a variety of *L. sericea*.

From *Benzoin umbellatum* Rehder fruiting specimens of *Litsea sericea* may be distinguished by the more chartaceous leaves finely but distinctly reticulate beneath, less so above, by the glabrous or nearly glabrous winter-buds and the smaller fruits only 4-5 mm. long and borne on slenderer pedicels.

Benzoin Fabricius

Benzoin published in 1763 by Fabricius (Enum. Meth. Pl. Helmstad. ed. 2, 401) is the oldest name for the genus usually called *Lindera* Thunberg (1783, non Adanson, 1763). As Fabricius gives a good generic description and cites as synonym *Laurus* 9 of Linnaeus' *Species plantarum* which is *Laurus Benzoin*, there can be no doubt that the name given by Fabricius is valid and I fail to understand why almost all European and Japanese botanists retain *Lindera* of Thunberg as the correct name for this genus.

Benzoin aromaticum, comb. nov. — *Lindera aromatica* Brandis in Hooker's Icon. XXVIII. t. 2784 (1905).

BURMA.

Benzoin cercidifolium, comb. nov. — *Lindera cercidifolia* Hemsley in Jour. Linn. Soc. XXVI. 387 (1891).

CHINA: Hupeh.

Benzoin commune, comb. nov. — *Lindera communis* Hemsley in Jour. Linn. Soc. XXVI. 387 (1891).

CHINA.

Benzoin erythrocarpum, comb. nov. — *Benzoin Thunbergii* Siebold & Zuccarini in Abh. Akad. Muench. iv. pt. III. 204 (Fl. Jap. Fam. Nat. II. 80) (1846), pro parte, quoad descriptionem; non *Sassafras Thunbergii* Sieb. — *Lindera umbellata* Blume, Mus. Bot. Lugd.-Bat. I. 324 (1851), pro parte, quoad descriptionem, non Thunberg. — *Lindera erythrocarpa* Makino in

Tokyo Bot. Mag., XI. (219) (1897), XIII. 138 (1899). — *Lindera Thunbergii* Makino, l. c. XIV. 184 (1900), non *Benzoin Thunbergii* Sieb. & Zucc.

JAPAN.

The reason Makino gives in Tokyo Bot. Mag. XIII. 140 for proposing a new name for this species is perfectly correct, while his transfer the following year of Siebold & Zuccarini's misapplied specific name "Thunbergii" is not correct according to our interpretation of the rules. The type of *Benzoin Thunbergii* is *Lindera umbellata* Thunberg and that name therefore becomes a synonym of *Benzoin umbellatum*.

Benzoin fragrans, comb. nov. — *Lindera fragrans* Oliver in Hooker's Icon. XVIII. t. 1788 (1888). — *Lindera* ? *Rosthornii* Diels in Bot. Jahrb. XXIX. 350 (1900).

CHINA: Hupeh.

Benzoin fruticosum, comb. nov. — *Lindera fruticosa* Hemsley in Jour. Linn. Soc. XXVI. 388 (1891).

CHINA: Hupeh.

Benzoin grandifolium, nom. nov. — *Lindera megaphylla* Hemsley in Jour. Linn. Soc. XXVI. 388 (1891).

CHINA.

Hemsley's specific name cannot be maintained, as there is the older valid combination *Benzoin megaphyllum* Kuntze.

Benzoin-pedunculatum, comb. nov. — *Lindera pedunculata* Diels in Bot. Jahrb. XXIX. 350 (1891).

CHINA: Szechuan.

Benzoin Prattii, comb. nov. — *Lindera Prattii*, Gamble in Sargent, Pl. Wilson, II. 83 (1914).

CHINA: Szechuan.

Benzoin obovatum, comb. nov. — *Lindera* ? *obovata* Franchet in Nouv. Arch. Mus. Paris, sér. 2, x. 76 (Pl. David. II. 114) (1887).

CHINA.

Benzoin Oldhamii, comb. nov. — *Lindera* ? *Oldhami* Hemsley in Jour. Linn. Soc. XXVI. 390 (1891).

FORMOSA.

Benzoin puberulum, comb. nov. — *Lindera puberula* Franchet in Nouv. Arch. Mus. Paris, sér. 2, x. 77 (Pl. David. II. 115) (1887).

CHINA.

Benzoin reflexum, comb. nov. — *Lindera reflexa* Hemsley in Jour. Linn. Soc. XXVI. 391 (1891).

CHINA: Kwangtung.

Benzoin rubronervium, comb. nov. — *Lindera rubronervia* Gamble in Sargent, Pl. Wilson, II. 82 (1914).

CHINA: Kiangsi.

Benzoin setchuenense, comb. nov. — *Lindera setchuenensis* Gamble in Sargent, Pl. Wilson, II. 82 (1914).

CHINA: Szechuan.

Benzoin strychnifolium Kuntze var. **Hemsleyanum**, comb. nov. — *Lin-*

Lindera strychnifolia var. ? Hemsley in Jour. Linn. Soc. xxvi. 392 (1891). — *Lindera strychnifolia* var. *Hemsleyana* Diels in Bot. Jahrb. xxix. 352 (1900).

CHINA: Hupeh, Szechuan.

Benzoin supracostatum, comb. nov. — *Lindera supracostata* H. Lecomte in Nouv. Arch. Mus. Nat. Hist. Paris, sér. 5, v. 113 (1913).

CHINA: Yunnan.

Benzoin umbellatum, comb. nov. — *Lindera umbellata* Thunberg, Fl. Jap. 145, t. 21 (1784). — *Sassafras Thunbergii* Siebold in Verh. Bat. Genoot. xii. pt. i. 23 (Syn. Pl. Oec. Jap.) (1830). — *Benzoin Thunbergii* Siebold & Zuccarini in Abh. Akad. Muench. iv. pt. iii. 204 (Fl. Jap. Fam. Nat. ii. 80) (1846), ex parte, excludenda descript. — *Lindera membranacea* Maximowicz in Bull. Acad. Sci. St. Pétersb. xii. 72 (1867); in Mél. Biol. vi. 175 (1867). — *Benzoin membranaceum* Kuntze, Rev. Gen. Pl. i. 569 (1891).

JAPAN. CHINA: Chekiang.

From China I have seen only a specimen from Ningpo, Chekiang, collected by D. Macgregor in 1908 which probably belongs here. All the other specimens referred by Hemsley and Gamble to *Lindera umbellata* as far as I have seen them, belong to *Litsea sericea* which see.

Benzoin umbellatum var. **hypoglaucum**, comb. nov. — *Lindera hypoglauca* Maximowicz in Bull. Acad. Sci. St. Pétersb. xii. 72 (1867); in Mél. Biol. vi. 274 (1867). — *Benzoin hypoleucum* Kuntze, Rev. Gen. Pl. i. 569 (1891). — *Benzoin hypoglaucum* Rehder in Bailey, Cycl. Am. Hort. i. 153 (1901). — *Lindera umbellata* var. *hypoglauca* Makino in Tokyo Bot. Mag. xiv. 185 (1900).

JAPAN.

Benzoin umbellatum var. **sericeum**, comb. nov. — *Benzoin sericeum* Siebold & Zuccarini in Abh. Akad. Muench. iv. pt. iii. 204 (Fl. Jap. Fam. Nat. i. 80) (1846). — *Lindera sericea* Blume, Mus. Bot. Lugd.-Bat. i. 324 (1851). — *Lindera umbellata* var. *sericea* Makino in Tokyo Bot. Mag. xiv. 185 (1900).

JAPAN.

Benzoin urophyllum, nom. nov. — *Lindera caudata* Diels in Bot. Jahrb. xxix. 352 (1900), non *Benzoin caudatum* (Nees) Kuntze.

CHINA: Szechuan.

(To be continued)